WHAT IS CLAIMED IS:

1. A frequency translating device (FTD) that utilizes a local oscillator (LO) to convert a radio frequency (RF) to an intermediate frequency (IF) and to convert an IF to a RF, said FTD comprising:

at least one mixer diode connected to down-convert an RF to an IF and to up-convert an IF to an RF, said mixer diode having a threshold voltage; and

means for controlling the excitation of the parasitic voltage-dependent capacitance of said at least one mixer diode to produce a reciprocal conversion response between said down-conversion and said up-conversion, said means for controlling the excitation of the parasitic voltage-dependent capacitance of said at least one mixer diode including a source of direct current (DC) bias that is electrically connected to said at least one mixer diode, said source of DC bias providing a DC bias to said at least one mixer diode that moves the voltage that is applied to said at least one mixer diode closer to said threshold voltage of said at least one mixer diode;

said at least one mixer diode being turned on in response to said DC bias and in response to an LO drive.

2. The FTD of claim 1 wherein said LO drive has an amplitude that is less than said threshold voltage of said at least one mixer diode.

3. The FTD of claim 1 wherein the sum of said DC bias and said LO drive periodically turns on said at least one mixer diode.

4. The FTD of claim 1 further including a second mixer diode connected to down-convert an RF to an IF and to up-convert an IF to an RF, said second mixer diode having a threshold voltage and including means for controlling the excitation of the parasitic voltage-dependent capacitance of said second mixer diode to produce a reciprocal conversion response between said down-conversion and said up-conversion, said means for controlling the excitation of the parasitic voltage-dependent capacitance of said second mixer diode including a source of direct current (DC) bias that is electrically connected to said second mixer diode, said source of DC bias providing a DC bias to said second mixer diode that moves the voltage that is applied to said second mixer diode closer to said threshold voltage of said second mixer diode, said second mixer diode being turned on in response to said DC bias and in response to said LO drive that is used to turn on said at least one mixer diode.

5. The FTD of claim 1 further including second, third, and fourth mixer diodes connected to down-convert an RF to an IF and to up-convert an IF to an RF, said second, third, and fourth mixer diodes having threshold voltages and including means for controlling the excitation of the parasitic voltage-dependent capacitance of said second, third, and fourth mixer diodes to produce a reciprocal conversion response between said down-conversion and said up-conversion, said means for controlling the excitation of the parasitic voltage-dependent capacitance including direct current (DC) bias sources that are electrically connected to said second, third, and fourth mixer diodes, said DC bias sources providing DC bias to said second, third, and fourth mixer diodes that moves the voltage that is applied to said second, third, and fourth mixer diodes closer to said threshold voltage of said second, third, and fourth mixer diodes, said second, third, and fourth mixer diodes being turned on in response to said DC bias and in response to said LO drive that is used to turn on said at least one mixer diode.

6. A method for operating a frequency translating device (FTD) that includes at least one mixer diode, said at least one mixer diode having a threshold voltage, said method comprising:

down-converting a radio frequency (RF) to an intermediate frequency (IF), said down-conversion having a down-conversion response;

up-converting an IF to an RF, said up-conversion having an up-conversion response;

controlling the excitation of the parasitic voltage-dependent capacitance of said at least one mixer diode during said down-conversion and said up-conversion to make said down-conversion response reciprocal to said up-conversion response by providing a direct current (DC) bias to said at least one mixer diode that moves the voltage that is applied to said at least one mixer diode closer to said threshold voltage of said at least one mixer diode; and

providing a local oscillator (LO) drive to said at least one mixer diode.

7. The method of claim 6 wherein said LO drive has an amplitude that is less than the threshold voltage of said at least one mixer diode.

8. The method of claim 6 wherein the sum of said DC bias and said LO drive periodically turns on said at least one mixer diode.

9. The method of claim 6 wherein said FTD is used for down-conversion and up-conversion in a three-pair measurement method, where the three pairs of FTDs are chosen from a group of three FTDs.

10. The method of claim 6 wherein said DC bias is in the range of 0.1 – 0.25 volts and said LO drive has a peak to peak maximum amplitude in the range of 0.05 – 0.2 volts.

11. A system for determining the conversion response of a device under test (DUT), the DUT is a frequency translation device (FTD), the system comprising:

means for coupling the DUT to a first test FTD (TM1) during a first measurement, for coupling said DUT to a second test FTD (TM2) during a second measurement, and for coupling said TM1 to said TM2 during a third measurement, said TM1 and TM2 are FTDs, said first measurement provides a first conversion response of said DUT coupled with said TM1 with one of the coupled DUT and TM1 being an up-converter FTD and the other one of said coupled DUT and TM1 being a down-converter FTD, said second measurement provides a second conversion response of said DUT coupled to said TM2 with one of said coupled DUT and TM2 being an up-converter FTD and the other one of said coupled DUT and TM2 being a down-converter FTD, the third measurement provides a third conversion response of said TM1 coupled with said TM2 with one of said coupled TM1 and TM2 being an up-converter FTD and the other one of said coupled TM1 and TM2 being a down-converter FTD, one of said TM1 FTD and TM2 FTD has reciprocal up-conversion and down-conversion responses, said reciprocal FTD is an up-converter during one of said first, second, or third measurements and is a down-converter during another one of said first, second, or third measurements, said reciprocal FTD including;

at least one mixer diode connected to down-convert and to up-convert, said mixer diode having a threshold voltage; and

means for controlling the excitation of the parasitic voltage-dependent capacitance of said at least one mixer diode to produce said reciprocal conversion response between said down-conversion and said up-conversion, said means for controlling the excitation of the parasitic voltage-dependent capacitance of said at least one mixer diode including a source of direct current (DC) bias that is electrically connected to said at least one mixer diode, said source of DC bias providing a DC bias to said at least one mixer diode that moves the voltage that is applied to said at least one mixer diode closer to said threshold voltage of said at least one mixer diode;

said at least one mixer diode being turned on in response to said DC bias and in response to a local oscillator (LO) drive;

an analyzer for measuring said first, second, and third measurements by providing an input signal at a first connection and by sampling an output signal from a second connection; and

a controller for calculating the conversion response of said DUT from said first, second, and third conversion responses.

12. The system of claim 11 wherein said LO drive has an amplitude that is less than said threshold voltage of said at least one mixer diode.

13. The system of claim 11 further including an LO source for providing said LO drive, wherein said up-conversion and down-conversion FTDs receive said LO drive for frequency translation.

14. The system of claim 13 further including an attenuator located between said LO source and said reciprocal FTD.

15. The system of claim 11 wherein the sum of said DC bias and said LO drive periodically turns on said at least one mixer diode.

16. The system of claim 11 wherein said reciprocal FTD further includes a second mixer diode connected to down-convert an RF to an IF and to up-convert an IF to an RF, said second mixer diode having a threshold voltage and including means for controlling the excitation of the parasitic voltage-dependent capacitance of said second mixer diode to produce a reciprocal conversion response between said down-conversion and said up-conversion, said means for controlling the excitation of the parasitic voltage-dependent capacitance of said second mixer diode including a source of direct current (DC) bias that is electrically connected to said second mixer diode, said source of DC bias providing a DC bias to said second mixer diode that moves the voltage that is applied to said second mixer diode closer to said threshold voltage of said second mixer diode, said second mixer diode being turned on in response to said DC bias and in response to said LO drive that is used to turn on said at least one mixer diode.

17. The system of claim 11 wherein said reciprocal FTD further includes second, third, and fourth mixer diodes connected to down-convert an RF to an IF and to up-convert an IF to an RF, said second, third, and fourth mixer diodes having threshold voltages and including means for controlling the excitation of the parasitic voltage-dependent capacitance of said second, third, and fourth mixer diodes to produce a reciprocal conversion response between said down-conversion and said up-conversion, said means for controlling the excitation of the parasitic voltage-dependent capacitance including direct current (DC) bias sources that are electrically connected to said second, third, and fourth mixer diodes, said DC bias sources providing DC bias to said second, third, and fourth mixer diodes that moves the voltage that is applied to said second, third, and fourth mixer diodes closer to said threshold voltage of said second, third, and fourth mixer diodes, said second, third, and fourth mixer diodes being turned on in response to said DC bias and in response to said LO drive that is used to turn on said at least one mixer diode.

18. The system of claim 11 wherein said analyzer includes means for measuring said first, second, and third conversion responses by providing an input signal at said first connection and by sampling the output signal at said second connection, for repeating said first measurement with said LO drive of one of said up or down converters phase shifted ninety degrees to provide a first repeated conversion response, for repeating said second measurement with said LO drive of one of the up or down converters phase shifted ninety degrees to provide a second repeated conversion response, and for repeating said third measurement with said LO drive of one of said up or down converters phase shifted ninety degrees to provide a third repeated conversion response, said reciprocal FTD is an up-converter during one of said first, second, or third measurements and respectively during said first, second, or third repeated measurements and is a down-converter during another one of said first, second, or third measurements and respectively during said first, second, or third repeated measurements; and

wherein said controller includes means for calculating the conversion response of said DUT from said first, second, and third conversion responses and said first, second, and third repeated conversion responses.

19. A method for determining the conversion response of a device under test (DUT), the DUT is a frequency translation device (FTD), the method comprising:

measuring a first conversion response of said DUT coupled with a first test device (TM1), said TM1 is an FTD, one of said coupled DUT and TM1 is an up-converter FTD and the other one of said coupled DUT and TM1 is a down-converter FTD;

measuring a second conversion response of said DUT coupled with a second test device (TM2), said TM2 is an FTD, one of said coupled DUT and TM2 is an up-converter FTD and the other one of said coupled DUT and TM2 is a down-converter FTD;

measuring a third conversion response of said TM1 coupled with said TM2, one of said coupled TM1 and TM2 is an up-converter FTD and the other one of said coupled TM1 and TM2 is a down-converter FTD, one of said TM1 FTD and TM2 FTD has reciprocal up-conversion and down-conversion responses, said reciprocal FTD is an up-converter during one of said first, second, or third measurements and is a down-converter during another one of said first, second, or third measurements, said reciprocal FTD including at least one mixer diode, wherein operation of said reciprocal FTD includes;

controlling the excitation of the parasitic voltage-dependent capacitance of said at least one mixer diode to make said down-conversion response reciprocal to said up-conversion response by providing a direct current (DC) bias to said at least one mixer diode that moves the voltage that is applied to said at least one mixer diode closer to said threshold voltage of said at least one mixer diode;

providing a local oscillator (LO) drive to said at least one mixer diode; and

calculating the conversion response of said DUT from said first, second, and third conversion responses.

20. The method of claim 19 wherein said LO drive has an amplitude that is less than the threshold voltage of said at least one mixer diode.

21. The method of claim 19 wherein the sum of said DC bias and said LO drive periodically turns on said at least one mixer diode.

22. The method of claim 19 wherein said DC bias is in the range of 0.1 – 0.25 volts and said LO drive has a peak to peak maximum amplitude in the range of 0.05 – 0.2 volts.

23. The method of claim 19 further including attenuating said LO drive before said LO drive is provided to said at least one mixer diode.

24. The method of claim 19 comprising:

repeating said first measurement with said LO drive of one of said up or down converters phase shifted ninety degrees to provide a first repeated conversion response;

repeating said second measurement with said LO drive of one of said up or down converters phase shifted ninety degrees to provide a second repeated conversion response;

repeating said third measurement with said LO drive of one of said up or down converters phase shifted ninety degrees to provide a third repeated conversion response, said reciprocal FTD is an up-converter during one of said first, second, or third measurements and respective first, second, or third repeated measurements and is a down-converter during another one of said first, second, or third measurements and respective first, second, or third repeated measurements; and

calculating the conversion response of said DUT from said first, second, and third conversion responses and said first, second, and third repeated conversion responses.